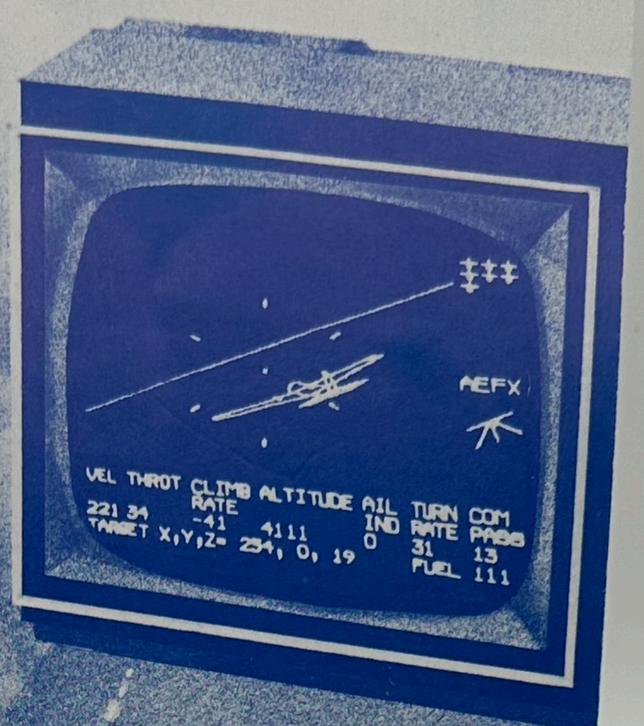
# SPITFIRE SIMULATOR

For the Apple II computer




apple II

Mind Systems Corporation

P.O. Box 506 Northampton, MA 01061 (413)586-6463

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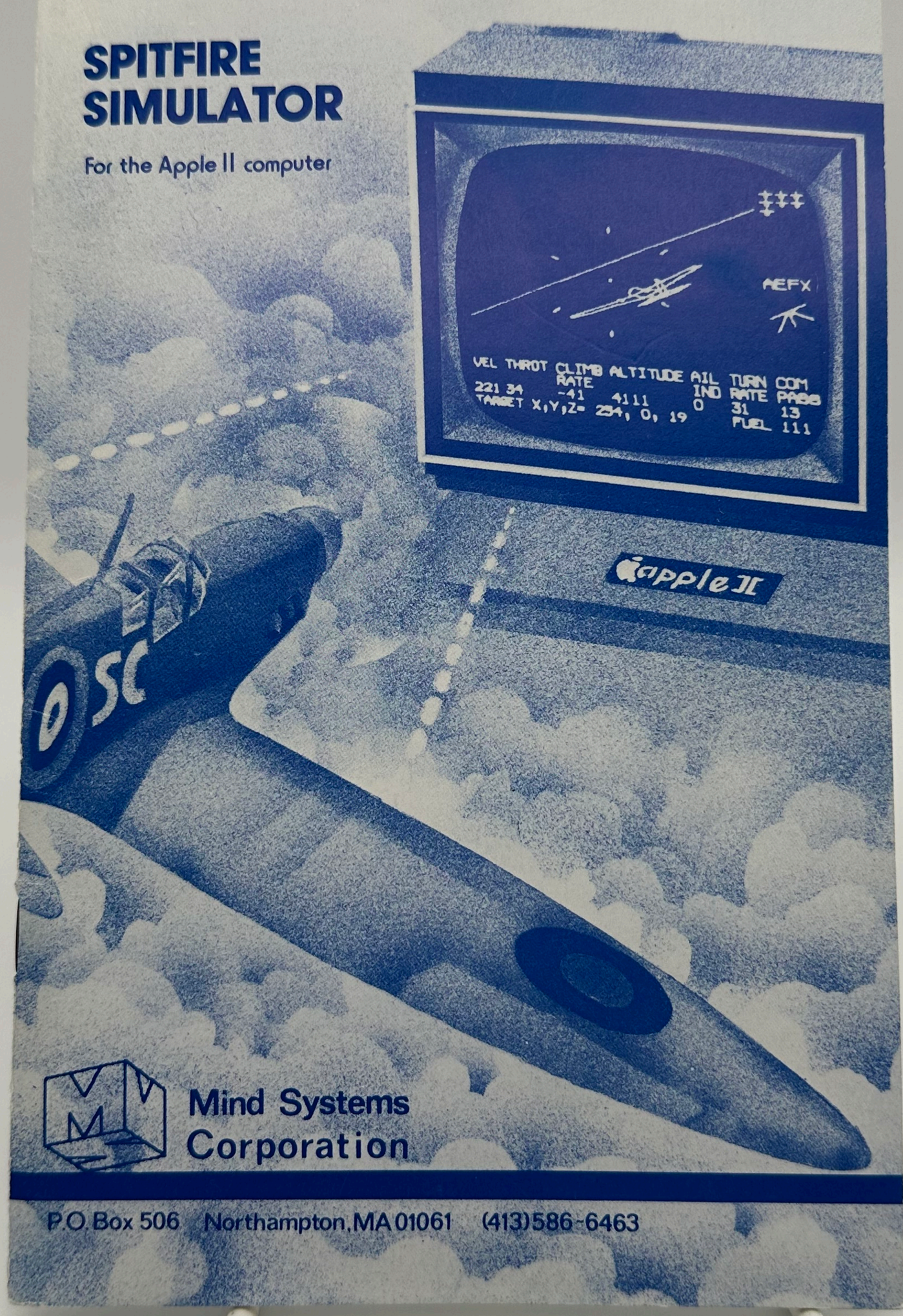


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SPITFIRE
SIMULATOR
For the Apple II computer
VEL THROT CLIMB ALTITUDE AIL TURN COM
RATE IND RATE PASS
221 34 -41 4111 0 31 13
TARGET X,Y,Z= 254, 0, 19 FUEL 111
AEFX
Apple II
Mind Systems
Corporation
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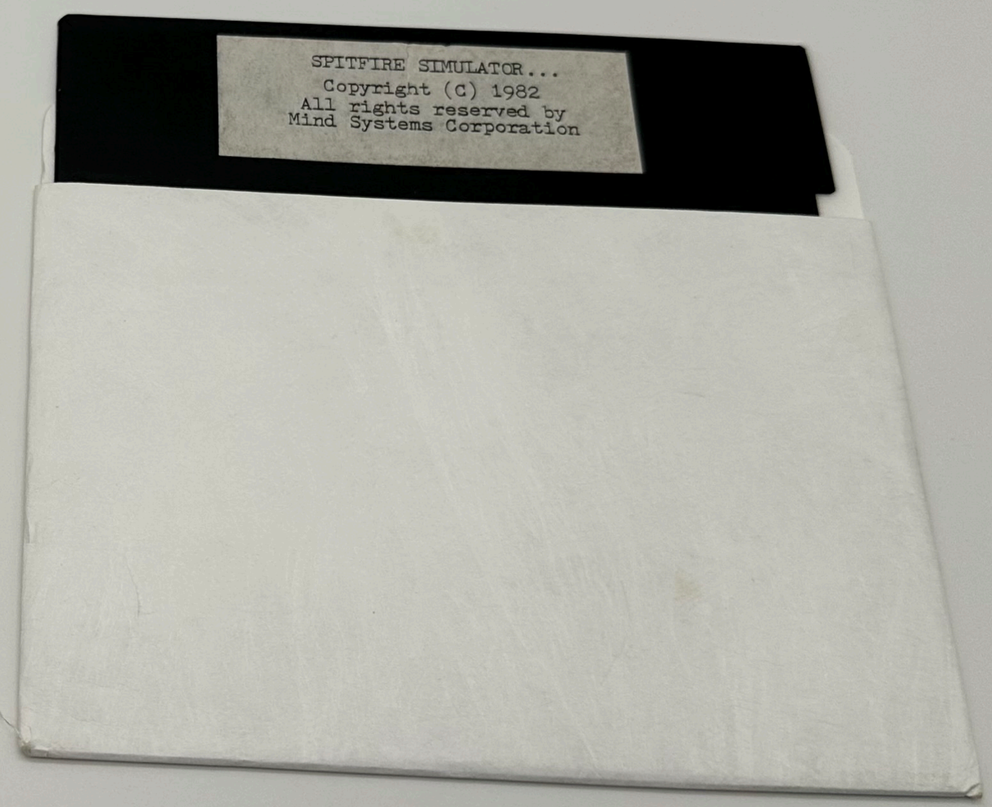
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# SPITFIRE SIMULATOR

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# SPITFIRE SIMULATOR
for the
Apple II Computer

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June 1982

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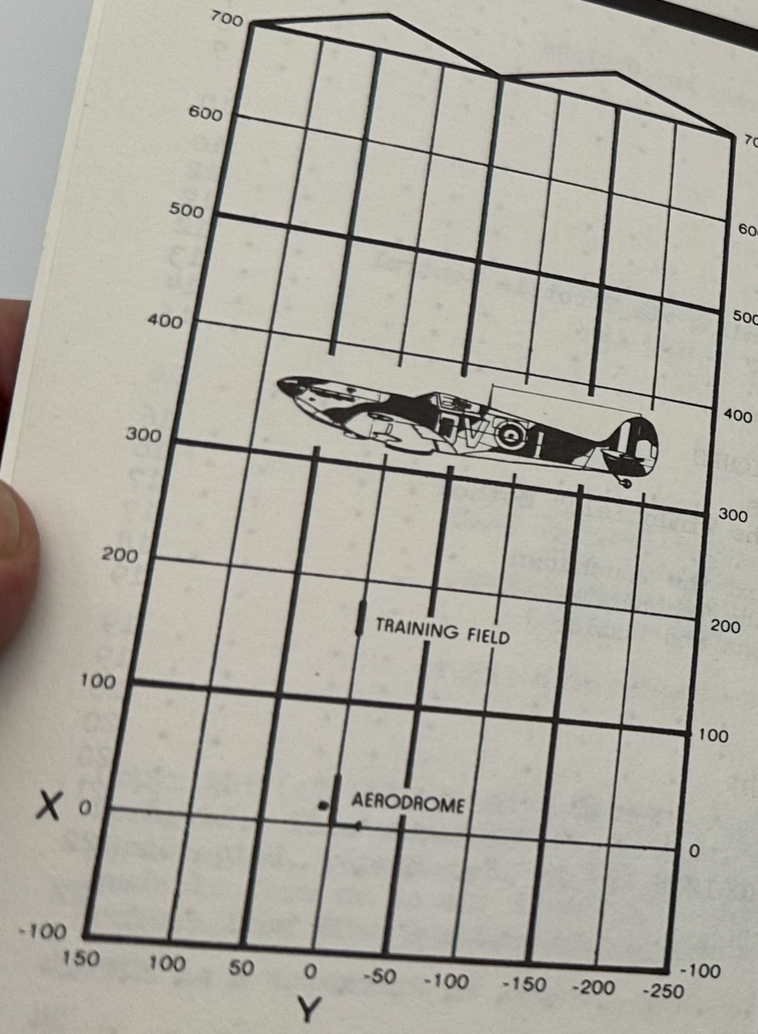
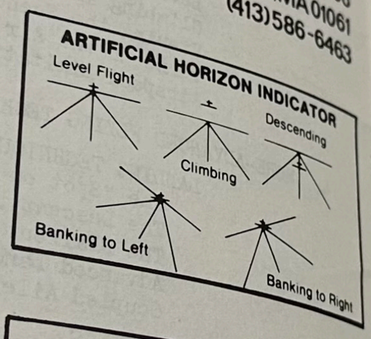
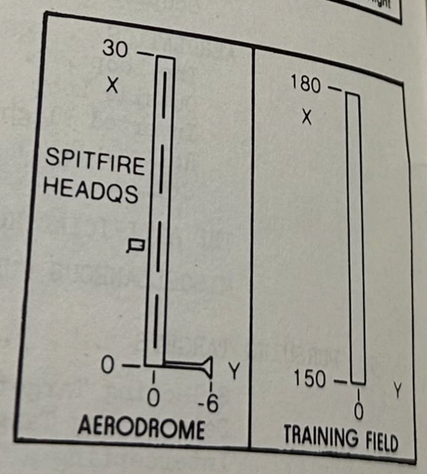
# Figure 1
# SPITFIRE SIMULATOR...

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**Drawn by: PHIL RAPP San Diego, Calif.**



## 1. INTRODUCTION

Simulation is one of the most interesting and enjoyable applications of digital computers. Simply turn on the computer, boot an appropriate disk, and you can move into another time, another place, to have experiences which would be either difficult or impossible to have otherwise. Use your Apple II or II PLUS computer and SPITFIRE SIMULATOR to take a journey with us, back in time to another era. Try to imagine that you are actually there. You are about to fly the fast and nimble Spitfire.

The time is early 1941, and the place is England. The Battle of Britain is underway. German airplanes are invading the skies of England, and it is your mission to help rid the skies of their presence. They come from the North or from the South, from the East or from the West. Some fly high and some fly low; some are slow and some are fast. Your fuel capacity will limit your opportunity to pursue your targets, and you can maximize your fuel economy by judicious use of the throttle. A special bonus awaits you if you can return safely to your Aerodrome at the end of a mission.

Your airplane is a Supermarine Spitfire Mk 1, the first production version of an airplane which was destined to become one of the most famous fighter airplanes of all time. It has a 1030 hp Rolls-Royce Merlin II engine, and a maximum level-flight speed of 360 mph. The design was an outcome of the Supermarine seaplane racers which competed very successfully in the famous Schneider Cup races. The designer, Reginald Mitchell, died tragically of cancer before he saw how successful his Spitfire was going to be. Nonetheless, the Spitfire underwent continual subsequent development. In its final form, the Mk 24 of 1947, its maximum speed in level flight was greater than 450 mph.

If you have flown another digital-computer airplane simulator, our AIRSIM-1 Flight Simulator for example, then you should find it easy to fly SPITFIRE SIMULATOR. If this is your first experience with airplane simulators, you'll have to learn to fly. You will be able to fly SPITFIRE SIMULATOR because we'll give you flying lessons. SPITFIRE SIMULATOR is surprisingly easy to fly. We've included a Grid scene with a training field directly ahead of the Aerodrome so

## A Takeoff

Use CTRL-I to get the airplane positioned at the south end of the Aerodrome with the airplane headed north (COMPASS=0), ready for a takeoff. Alternately, you can taxi the airplane into position. Set the ailerons and elevator to normal sensitivity (no "A" or "E" on the screen) and have the flaps up (no "F" on screen). Apply full up elevator. (/ key) and watch the plane gather speed. Apply full throttle When the airplane reaches about 140 to 150 mph, you'll lift off the ground. The plane may bounce before finally lifting off; some up trim may help if that happens. Adjust the elevators so that you are climbing with the horizon just barely in view. Switch to Scene No. 1 now (press the 1 key). When you reach an altitude of 1000 ft, reduce the amount of up elevator to level the plane off gradually, and at the same time reduce the throttle setting to 49%. Doing this, we usually end up leveled off at an altitude of about 1500 ft with an airspeed of about 260 mph. You took off!

## Level Flight

After taking off as described above, use the elevator to cruise in a due-north direction in level flight with the throttle at 49%. Your airspeed should be approximately 260 mph and your altitude should be about 1500 ft. Practice making small adjustments to the elevator, and see if you can maintain level flight. Please don't overcontrol the airplane! Apply a little up elevator and hold that elevator position constant while you observe how the airplane is going to respond. If this response is not what you wanted, make another small change in elevator position and wait again to see what the response is. Learning how to fly involves developing an intuitive feeling for how the airplane is going to respond. Once you've developed this intuition, you'll no longer need to wait after a control input, because you'll know from experience how the airplane is going to respond. It takes time to develop this feel for an airplane. That's a lot of what learning to fly is all about.

## Climbing and Descending via Throttle Control

Once the elevator is adjusted for approximately level flight as described above, try increasing and decreasing the throttle setting. Increasing the throttle will cause the airplane speed to increase, and the airplane will start to climb. Conversely, decreasing the



throttle will cause the airplane speed to decrease, and the airplane will start to descend. There are thus two ways to control the altitude of an airplane - by means of the elevator and by means of the throttle. Experienced pilots know just what throttle settings to use to achieve a desired rate of descent when making a landing approach. You can learn that too for SPITFIRE SIMULATOR!

## Viewing the Scenery

SPITFIRE SIMULATOR has two stationary scenes and eight moving targets. We'll postpone chasing the targets until after you've familiarized yourself with SPITFIRE SIMULATOR. For now we'll restrict ourselves to the two scenes, the Aerodrome (Scene 0) and the Grid (Scene 1). Takeoff and get into level flight as described above. If you've not already done so, press the 1 key. The disk will then read in the Grid scene. Figure 1 is a map of the Grid scene. We're going to use the transport command (CTRL-T) to take a little trip around the Grid. Press CTRL-T. You'll be shown your present map coordinates. Respond with X=0, Y=0 and Z=8. The airplane will suddenly jump to a new position, over the south end of the Aerodrome at an altitude of 1600 feet. Activate the radar with the R key, and you should see a schematic representation of the Aerodrome, with you being at the south end and moving north. It might be necessary for you to adjust the radar scale with the +, - or @ keys. If you really want to see yourself over the Aerodrome, simply load Scene 0 from the disk by pressing the 0 key. After you're satisfied, load the Grid scene (Scene 1) back in again by pressing the 1 key. Now we'll take a real computer trip. Get the scenery back again by pressing the S key. Now transport the airplane (CTRL-T) to X=-5000, Y=0 and Z=500. Wow! Look at that! (We assume you're flying level to the north as you were told.) That little postage-stamp looking thing up ahead is the Grid viewed from where we are now, far to the south, looking north. Try playing around on your own. Leave the airplane flying level and headed north, and transport yourself around. Use both Scenes 0 and 1, and use both the S and R keys, with the radar-scale changing commands, to get a feel for the flying space. Use Figure 1, and try to transport yourself to specific locations on that chart.

streak out from the wings and then disappear. The
graphics erase any dots on the screen that they pass over. If a
pass over the image of a target, they will erase that part of
e target image. This does not mean that they hit the target. If a
target is destroyed, you will see an explosion issue from the target.
target will disappear. Simultaneously, a small airplane
the target will appear in the upper right-hand corner of the screen to
symbol will appear in the upper right-hand corner of the screen. Also the disk drive will auto-
indicate that a target was destroyed. Also the target type being selected
matically read in data for the next, the target type being selected and
randomly by the computer. If you press CTRL-S, you'll see your score,
showing the number of targets you've destroyed on this mission and
your rank. SPITFIRE SIMULATOR can record up to 30 targets destroyed
on the screen, but CTRL-S can indicate up to 255 hits! We doubt
very much that anyone will ever destroy even 30 targets on one
mission!

When a target is destroyed, a new target is selected randomly by the computer. However, you also always have complete control over the type of target available for you to pursue. To select a specific type of target at any time, simply press the number key appropriate for that target type as described in Section 2.

Bonus for Successful Mission Completion

Your mission is not completed successfully until you have landed at your Aerodrome. You'll have to keep an eye on your fuel, because the magical CTRL-T command will transport you only so long as you do have fuel! You probably will want to use this command to assist you in your landing approach, so don't use up all your fuel chasing targets. Of course, if you are a purist, you can fly all the way without the aid of the CTRL-T command. The option is yours. You can also glide after your fuel is gone, but the Spitfire was not designed as a glider! If you do succeed in landing after destroying one or more targets, you will receive a handsome bonus.



SUMMARY OF COMMANDS

Push Buttons - Fire machine guns.

Paddle 0 - Elevator, counterclockwise up.

Paddle 1 - Aileron/rudder, clockwise right.

/ key - Toggle throttle.

→ key - Increase throttle gradually.

← key - Decrease throttle gradually.

. key - Brake.

A key - Toggle aileron sensitivity.

E key - Toggle elevator sensitivity.

F key - Toggle flaps.

G key - Toggle gunsight.

L key - Level the wings.

R key - Radar

S key - Scenery.

X key - Toggle aileron-rudder coupling.

@ key - Initialize radar scale.

+ key - Increase radar scale gradually.

- key - Decrease radar scale gradually.

CTRL-B - Begin pursuit of targets.

CTRL-C - Continue the simulation.

CTRL-I - Initialize the simulation.

CTRL-P - Pause in the simulation.

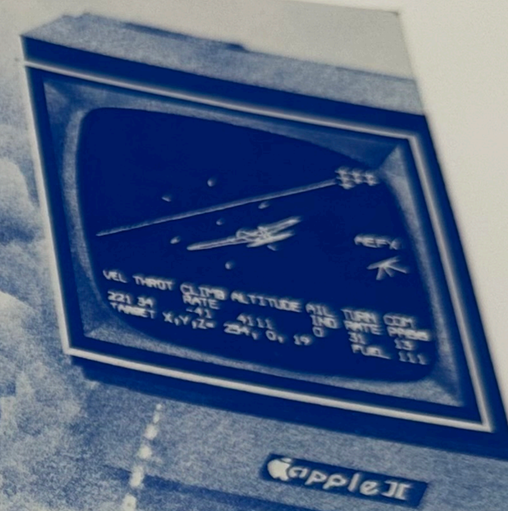
CTRL-S - Score for targets destroyed.

CTRL-T - Transport the airplane.

0-9 keys - Select scenes or targets.

# SPITFIRE SIMULATOR

For the Apple II computer

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